

January 15, 2013

Mr. Jason Gunter Remedial Project Manager U.S. Environmental Protection Agency Region 7 - Superfund Branch 901 North 5th Street Kansas City, KS 66101

Re: National Mine Tailings Site Progress Report

Dear Mr. Gunter:

As required by Article VI, Section 51 of the Unilateral Administrative Order (Docket No.CERCLA-07-2006-0231) for the referenced project and on behalf of The Doe Run Company and NL Industries, Inc., the progress report for the period December 1, 2012 through December 31, 2012 is enclosed. If you have any questions or comments, please call me at 573-638-5020 or Mark Nations at 573-518-0800.

Sincerely,

Ty L. Morris, P.E., R.G.

Vice President

TLM/jms Enclosure

c: Mark Nations - TDRC

Matt Wohl – TDRC (electronic only)

Kevin Lombardozzi – NL Industries, Inc.

John Kennedy - City of Park Hills

Norm Lucas - Park Hills - Leadington Chamber of Commerce

Kathy Rangen - MDNR

Tim Skoglund - Barr Engineering

DTWH

40417191 Superfund

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National Mine Tailings Site

Park Hills, Missouri

Removal Action - Monthly Progress Report

Period: December 1, 2012 – December 31, 2012

1. Actions Performed and Problems Encountered This Period:

a. No activities were completed at the site during this period.

2. Analytical Data and Results Received This Period:

- a. During this period, water samples were collected at the sampling locations identified in Appendix C of the Removal Action Work Plan where water was present. Copies of the analytical results from the last sampling event are included with this progress report.
- b. During this period, the Ambient Air Monitoring Report for September 2012 was received. Any issues identified in this report are discussed below. A copy of this document has been sent to your attention.

The September 2012 Ambient Air Monitoring Report noted the following:

- The action levels for lead and dust were not exceeded.
- No samples were taken with the TSP and PM₁₀ monitors on 09/03/12 due to the holiday.
- No samples were taken with the National #2 (Soccer Field) TSP monitor on 09/21/12 due to mechanical failure. Upon discovery, the issue was corrected.
- No samples were taken with the Big River #4 (Primary) PM₁₀ monitor on 09/21/12 due to mechanical failure. Upon discovery, the issue was corrected.

3. Developments Anticipated and Work Scheduled for Next Period:

- a. Complete work in the Mine Shaft Area.
- b. Begin developing the Removal Action Report.
- c. Complete monthly water sampling activities as described in the Removal Action Work Plan.
- d. Complete air monitoring activities as described in the Removal Action Work Plan.

4. Changes in Personnel:

a. None.

5. Issues or Problems Arising This Period:

a. None.

6. Resolution of Issues or Problems Arising This Period:

a. None.

End of Monthly Progress Report



December 19, 2012

Allison Olds
Barr Engineering Company
1001 Diamond Ridge
Suite 1100
Jefferson City, MO 65109

TEL: (573) 638-5007 FAX: (573) 638-5001

RE: National Tailings Pile - Design and Construction

Dear Allison Olds:

TEKLAB, INC received 1 sample on 12/13/2012 12:05:00 PM for the analysis presented in the following report.

Samples are analyzed on an as received basis unless otherwise requested and documented. The sample results contained in this report relate only to the requested analytes of interest as directed on the chain of custody. NELAP accredited fields of testing are indicated by the letters NELAP under the Certification column. Unless otherwise documented within this report, Teklab Inc. analyzes samples utilizing the most current methods in compliance with 40CFR. All tests are performed in the Collinsville, IL laboratory unless otherwise noted in the Case Narrative.

All quality control criteria applicable to the test methods employed for this project have been satisfactorily met and are in accordance with NELAP except where noted. The following report shall not be reproduced, except in full, without the written approval of Teklab, Inc.

If you have any questions regarding these tests results, please feel free to call.

Sincerely,

Michael L. Austin

Project Manager

(618)344-1004 ex 16

MAustin@teklabinc.com

WorkOrder: 12120697



Report Contents

http://www.teklabinc.com/

Client: Barr Engineering Company

Client Project: National Tailings Pile - Design and Construction

Work Order: 12120697

Report Date: 19-Dec-12

This reporting package includes the following:

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Chain of Custody	Appended



Definitions

http://www.teklabinc.com/

Client: Barr Engineering Company Work Order: 12120697

Client Project: National Tailings Pile - Design and Construction Report Date: 19-Dec-12

Abbr Definition

- CCV Continuing calibration verification is a check of a standard to determine the state of calibration of an instrument between recalibration.
- DF Dilution factor is the dilution performed during analysis only and does not take into account any dilutions made during sample preparation. The reported result is final and includes all dilutions factors.
- DNI Did not ignite
- DUP Laboratory duplicate is an aliquot of a sample taken from the same container under laboratory conditions for independent processing and analysis independently of the original aliquot.
- ICV Initial calibration verification is a check of a standard to determine the state of calibration of an instrument before sample analysis is initiated.
- IDPH IL Dept. of Public Health
- LCS Laboratory control sample, spiked with verified known amounts of analytes, is analyzed exactly like a sample to establish intra-laboratory or analyst specific precision and bias or to assess the performance of all or a portion of the measurement system. The acceptable recovery range is in the QC Package (provided upon request).
- LCSD Laboratory control sample duplicate is a replicate laboratory control sample that is prepared and analyzed in order to determine the precision of the approved test method. The acceptable recovery range is listed in the QC Package (provided upon request).
 - MB Method blank is a sample of a matrix similar to the batch of associated sample (when available) that is free from the analytes of interest and is processed simultaneously with and under the same conditions as samples through all steps of the analytical procedures, and in which no target analytes or interferences should present at concentrations that impact the analytical results for sample analyses.
- MDL Method detection limit means the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero and is determined from analysis of a sample in a given matrix type containing the analyte.
- MS Matrix spike is an aliquot of matrix fortified (spiked) with known quantities of specific analytes that is subjected to the entire analytical procedures in order to determine the effect of the matrix on an approved test method's recovery system. The acceptable recovery range is listed in the QC Package (provided upon request).
- MSD Matrix spike duplicate means a replicate matrix spike that is prepared and analyzed in order to determine the precision of the approved test method. The acceptable recovery range is listed in the QC Package (provided upon request).
- MW Molecular weight
- ND Not Detected at the Reporting Limit
- NELAP NELAP Accredited
 - PQL Practical quantitation limit means the lowest level that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operation conditions. The acceptable recovery range is listed in the QC Package (provided upon request).
 - RL The reporting limit the lowest level that the data is displayed in the final report. The reporting limit may vary according to customer request or sample dilution. The reporting limit may not be less than the MDL.
 - RPD Relative percent difference is a calculated difference between two recoveries (ie. MS/MSD). The acceptable recovery limit is listed in the QC Package (provided upon request).
 - SPK The spike is a known mass of target analyte added to a blank sample or sub-sample; used to determine recovery deficiency or for other quality control purposes.
 - Surr Surrogates are compounds which are similar to the analytes of interest in chemical composition and behavior in the analytical process, but which are not normally found in environmental samples.

TNTC Too numerous to count (> 200 CFU)

Qualifiers

- # Unknown hydrocarbon
- E Value above quantitation range
- M Manual Integration used to determine area response
- R RPD outside accepted recovery limits
- X Value exceeds Maximum Contaminant Level

- B Analyte detected in associated Method Blank
- H Holding times exceeded
- ND Not Detected at the Reporting Limit
 - S Spike Recovery outside recovery limits



Case Narrative

http://www.teklabinc.com/

Client: Barr Engineering Company

Work Order: 12120697

Client Project: National Tailings Pile - Design and Construction

ODEQ

Oklahoma

Report Date: 19-Dec-12

Cooler Receipt Temp: 3.2 °C

Locations and Accreditations

	Collinsville			Springfield		Kansas City			
Address	5445 Horseshoe Lake Road	Add	lress	3920 Pintail Dr		Address	8421 Nieman Road		
	Collinsville, IL 62234-7425			Springfield, IL 627	11-9415		Lenexa, KS 66214		
Phone	(618) 344-1004	Pho	ne	(217) 698-1004		Phone	(913) 541-1998		
Fax	(618) 344-1005	Fax		(217) 698-1005		Fax	(913) 541-1998		
Email	nail jhriley@teklabinc.com Email KKlostermann@teklabinc.co		labinc.com	Email	dthompson@teklabinc.com				
State		Dept		Cert#	NELAP	Exp Date	Lab		
Illinois	3	IEPA		100226	NELAP	1/31/2013	Collinsville		
Kansas	S	KDHE		E-10374	NELAP	1/31/2013	Collinsville		
Louisia	ana	LDEQ		166493	NELAP	6/30/2013	Collinsville		
Louisia	ana	LDEQ		166578	NELAP	6/30/2013	Springfield		
Texas		TCEQ		T104704515-12-1	NELAP	7/31/2013	Collinsville		
Arkans	sas	ADEQ		88-0966		3/14/2013	Collinsville		
Illinois	3	IDPH		17584		4/30/2013	Collinsville		
Kentuc	cky	UST		0073		5/26/2013	Collinsville		
Missou	ıri	MDNR		00930		4/13/2013	Collinsville		

9978

8/31/2013

Collinsville



Laboratory Results

http://www.teklabinc.com/

Client: Barr Engineering Company

Work Order: 12120697

Client Project: National Tailings Pile - Design and Construction

Report Date: 19-Dec-12

Lab ID: 12120697-001

Client Sample ID: Nat-East

Matrix: AQUEOUS

Collection Date: 12/12/2012 10:50

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
EPA 600 375.2 REV 2.0 1993	(TOTAL)	ne superpuer.				dun sgrange * *	75 Pen 175 P	
Sulfate	NELAP	200	S	231	mg/L	20	12/18/2012 19:25	R171785
MS and/or MSD did not recover w	vithin control limits due to n	natrix interfer	ence.					
STANDARD METHOD 4500-	H B, LABORATORY AN	NALYZED				Ha File	and a family family	
Lab pH	NELAP	1.00		8.09		1	12/14/2012 13:00	R171621
STANDARD METHODS 2340	C T	11/1						
Hardness, as (CaCO3)	NELAP	5		510	mg/L	1	12/14/2012 7:48	R171594
STANDARD METHODS 2540	C (TOTAL)				9-147E		24476350	
Total Dissolved Solids	NELAP	20		620	mg/L	1	12/13/2012 22:15	R171635
STANDARD METHODS 2540	D			Garage 1		PINES!		
Total Suspended Solids	NELAP	6	The state of the s	< 6	mg/L	1	12/14/2012 16:17	R171644
STANDARD METHODS 2540	F				Parlie II			
Solids, Settleable	NELAP	0.1	CHECOTO OF CHEEN CHAPMAN CHE	< 0.1	ml/L	1	12/13/2012 17:49	R171553
STANDARD METHODS 5310	C, ORGANIC CARBO	N				194529+ F	100000000000000000000000000000000000000	
Total Organic Carbon (TOC)	NELAP	1.0	- 1	< 1.0	mg/L	1	12/14/2012 14:23	R171662
EPA 600 4.1.1, 200.7R4.4, MI	ETALS BY ICP (DISSO	LVED)				del de la companya de		
Cadmium	NELAP	2.00	E US LIFERN CATALOR TRAC	< 2.00	μg/L	1	12/14/2012 23:13	84205
Zinc	NELAP	10.0		125	μg/L	1	12/14/2012 23:13	84205
EPA 600 4.1.4, 200.7R4.4, ME	TALS BY ICP (TOTAL)				Asia Sea		107862
Cadmium	NELAP	2.00	THE PERSON NAMED IN THE PERSON NAMED IN	< 2.00	µg/L	1	12/14/2012 18:55	84207
Zinc	NELAP	10.0		137	µg/L	1	12/14/2012 18:55	84207
STANDARD METHODS 3030	E, 3113 B, METALS E	BY GFAA		No. of the State o		ar energy	A CALLED	
Lead	NELAP	2.00	TO STATE OF THE PARTY OF THE PA	4.63	μg/L	1	12/14/2012 9:47	84203
STANDARD METHODS 3030	B, 3113 B, METALS B	Y GFAA (D	ISSOLVE	D)				
Lead	NELAP	2.00	actions than titheraffice of the History	4.64	µg/L	1	12/14/2012 13:04	84204



Sample Summary

http://www.teklabinc.com/

Client: Barr Engineering Company

Client Project: National Tailings Pile - Design and Construction

Work Order: 12120697

Lab Sample ID	Client Sample ID	Matrix	Fractions	Collection Date
12120697-001	Nat-East	Aqueous	5	12/12/2012 10:50



Dates Report

http://www.teklabinc.com/

Client: Barr Engineering Company

Work Order: 12120697

Client Project: National Tailings Pile - Design and Construction

Sample ID	Client Sample ID	Collection Date	Received Date	E STANT HAVE	ing participation of the second
	Test Name			Prep Date/Time	Analysis Date/Time
12120697-001A	Nat-East	12/12/2012 10:50	12/13/2012 12:05		
	Standard Methods 2540 F				12/13/2012 17:49
12120697-001B	Nat-East	12/12/2012 10:50	12/13/2012 12:05		Land Company of the C
	EPA 600 375.2 Rev 2.0 1993 (Total)				12/18/2012 19:25
	Standard Method 4500-H B, Laboratory Analyzed				12/14/2012 13:00
	Standard Methods 2340 C				12/14/2012 7:48
	Standard Methods 2540 C (Total)				12/13/2012 22:15
	Standard Methods 2540 D				12/14/2012 16:17
12120697-001C	Nat-East	12/12/2012 10:50	12/13/2012 12:05	Maria Paris	
	EPA 600 4.1.4, 200.7R4.4, Metals by ICP (Total)		SALAC IDRIQUES SCENZE STREET SALORA	12/13/2012 15:46	12/14/2012 18:55
	Standard Methods 3030 E, 3113 B, Metals by GFAA			12/13/2012 15:10	12/14/2012 9:47
12120697-001D	Nat-East	12/12/2012 10:50	12/13/2012 12:05		
	EPA 600 4.1.1, 200.7R4.4, Metals by ICP (Dissolved)			12/13/2012 16:45	12/14/2012 23:13
	Standard Methods 3030 B, 3113 B, Metals by GFAA (I	Dissolved)		12/13/2012 15:05	12/14/2012 13:04
12120697-001E	Nat-East	12/12/2012 10:50	12/13/2012 12:05		
	Standard Methods 5310 C, Organic Carbon		eperatura de la Propia Referencia de la Calendaria de la Calendaria de la Calendaria de la Calendaria de la Ca Calendaria	BERTARDA DARIO DE LA CARRA	12/14/2012 14:23



http://www.teklabinc.com/

Client: Barr Engineering Company

Work Order: 12120697

Client Project: National Tailings Pile - Design and Construction

EPA 600 375.2 REV	2.0 1993 (7	TOTAL)					AN CONTRACTOR OF THE CONTRACTO			object by	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Batch R171678 SampID: MBLK	SampType:	MBLK		Units mg/L							Date
Analyses			RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit High	Limit	Analyzed
Sulfate			10		< 10						12/14/2012
Batch R171678 SampID: LCS	SampType:	LCS		Units mg/L							Date
Analyses			RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit High I		Analyzed
Sulfate			10		22	20	0	108.2	90 110		12/14/2012
Batch R171785 S SampID: MBLK	SampType:	MBLK		Units mg/L							Date
Analyses			RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit High I	Limit	Analyzed
Sulfate			10		< 10						12/18/2012
Batch R171785 S SampID: LCS	SampType:	LCS		Units mg/L						5	Date
Analyses			RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit High I	Limit	Analyzed
Sulfate			10		21	20	0	105.4	90 110		12/18/2012
Batch R171785 S	SampType: 01BMS	MS		Units mg/L						9 2	Date
Analyses			RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit High I	Limit	Analyzed
Sulfate			200	S	382	200	230.8	75.8	90 110		12/18/2012
Batch R171785 S SampID: 12120697-00	SampType: 01BMSD	MSD		Units mg/L					RPD Limit 1	10	Date
Analyses			RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val %F	RPD	Analyzed
Sulfate			200	S	398	200	230.8	83.4	382.4	3.88	12/18/2012
STANDARD METHO	D 4500-H E	B, LAB	ORATO	RY ANALYZED							
Batch R171621 S SampID: LCS	SampType:	LCS		Units						100 g st	Date
Analyses			RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit High L	_imit	Analyzed
Lab pH			1.00		6.99	7.00	0	99.9	99.1 100.	.8	12/14/2012
Batch R171621 S	SampType:	DUP		Units		s			RPD Limit 1	10	Date
Analyses			RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val %F	RPD	Analyzed
Lab pH			1.00		8.09	- 1			8.090	0.00	12/14/2012



http://www.teklabinc.com/

Client: Barr Engineering Company

Work Order: 12120697

Client Project: National Tailings Pile - Design and Construction

Batch R171594 SampTy	ype: MBLK		Units mg/L	e e w 2. beritte	1278.4074.552	SEEDER SEEDER SEEDER LEVER FOR		1.000000000000000000000000000000000000		A SECURE SERVED TO THE SECURE
SampID: MB-R171594	ype. WBL	•	Onits Ing/L							Date
Analyses		RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Analyzed
Hardness, as (CaCO3)		5		< 5			×			12/14/2012
Batch R171594 SampTy	ype: LCS	10	Units mg/L							Date
Analyses		RL	Qual	Result	Snike	SPK Ref Val	%REC	Low Limit	High Limit	Analyzed
Hardness, as (CaCO3)		5	Quui	1000		0	100.0	90	110	12/14/2012
Batch R171594 SampTy SampID: 12120697-001BMS	ype: MS		Units mg/L					8°	N _e	Date
Analyses		RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Analyzed
Hardness, as (CaCO3)		5		700	200	510.0	95.0	85	115	12/14/2012
Batch R171594 SampTy SampID: 12120697-001BMSI			Units mg/L		er n			RPD	Limit 10	Date
Analyses		RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref	Val %RPD	Analyzed
Hardness, as (CaCO3)		5		700	200	510.0	95.0	700.0	0.00	12/14/2012
	1,7,12,123,42		NO THE PARTY ASSESSMENT	THE THIRT PERSON AND THE	W. 25 F. 25 Y. 19 F.	Control and the second		1.00 June 1.00 E. 10	ela della	so - sur un content d'arrers d'ésc.
STANDARD METHODS 25	40 C (TOT)	AL)								
	40 C (TOT) pe: MBLK	0.000	Units mg/L							
CONTRACT OF THE CONTRACT OF TH	1 100	0.000	Units mg/L							Date
Batch R171635 SampTy	1 100	0.000	Units mg/L Oual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Batch R171635 SampTy SampID: MBLK	1 100			Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Analyzed 12/13/2012
Batch R171635 SampTy SampID: MBLK Analyses	1 100	RL			Spike	SPK Ref Val	%REC	Low Limit	High Limit	Analyzed
Batch R171635 SampTy SampID: MBLK Analyses Total Dissolved Solids	1 100	RL 20		< 20	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Analyzed 12/13/2012
Batch R171635 SampTy SampID: MBLK Analyses Total Dissolved Solids Total Dissolved Solids Total Dissolved Solids	1 100	RL 20 20		< 20 < 20	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Analyzed 12/13/2012 12/13/2012
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Batch R171635 SampTy SampID: MBLK Analyses Total Dissolved Solids Total Dissolved Solids Total Dissolved Solids Total Dissolved Solids Batch R171635 SampTy SampID: LCS Analyses Total Dissolved Solids Batch R171635 SampTy SampID: LCS Batch R171635 SampTy SampID: LCSQC	ype: MBLK	RL 20 20 20 RL 20	Qual Units mg/L Qual Units mg/L	< 20 < 20 < 20 Result	Spike 1000	SPK Ref Val 0	%REC 109.6	Low Limit	High Limit	Analyzed 12/13/2012 12/13/2012 12/13/2012 Date Analyzed
Batch R171635 SampTy SampID: MBLK Analyses Total Dissolved Solids Total Dissolved Solids Total Dissolved Solids Total Dissolved Solids Batch R171635 SampTy SampID: LCS Analyses Total Dissolved Solids Batch R171635 SampTy SampTy	ype: MBLK	RL 20 20 20 RL 20 C	Qual Units mg/L Qual	< 20 < 20 < 20 Result 1100	Spike 1000 Spike	SPK Ref Val 0	%REC 109.6	Low Limit 90	High Limit	Analyzed 12/13/2012 12/13/2012 12/13/2012 Date Analyzed 12/13/2012 Date Analyzed
Batch R171635 SampTy SampID: MBLK Analyses Total Dissolved Solids Total Dissolved Solids Total Dissolved Solids Total Dissolved Solids Batch R171635 SampTy SampID: LCS Analyses Total Dissolved Solids Batch R171635 SampTy SampID: LCS Analyses Total Dissolved Solids	ype: MBLK	RL 20 20 20 RL 20	Qual Units mg/L Qual Units mg/L	< 20 < 20 < 20 Result	Spike 1000 Spike 1000	SPK Ref Val 0 SPK Ref Val	%REC 109.6 %REC	Low Limit 90 Low Limit	High Limit 110 High Limit	Analyzed 12/13/2012 12/13/2012 12/13/2012 Date Analyzed 12/13/2012 Date
Batch R171635 SampTy SampID: MBLK Analyses Total Dissolved Solids Total Dissolved Solids Total Dissolved Solids Batch R171635 SampTy SampID: LCS Analyses Total Dissolved Solids Batch R171635 SampTy SampID: LCSQC Analyses Total Dissolved Solids Total Dissolved Solids Total Dissolved Solids Total Dissolved Solids Total Dissolved Solids Total Dissolved Solids Total Dissolved Solids	ype: MBLK	RL 20 20 20 C RL 20	Qual Units mg/L Qual Units mg/L	< 20 < 20 < 20 < 20 Result 1100	Spike 1000 Spike 1000	SPK Ref Val 0 SPK Ref Val 0	%REC 109.6 %REC 109.6	Low Limit 90 Low Limit 90	High Limit 110 High Limit 110	Analyzed 12/13/2012 12/13/2012 12/13/2012 Date Analyzed 12/13/2012 Date Analyzed 12/13/2012 12/13/2012
Batch R171635 SampTy SampID: MBLK Analyses Total Dissolved Solids Total Dissolved Solids Total Dissolved Solids Total Dissolved Solids Batch R171635 SampTy SampID: LCS Analyses Total Dissolved Solids Batch R171635 SampTy SampID: LCSQC Analyses Total Dissolved Solids Total Dissolved Solids Total Dissolved Solids Total Dissolved Solids	/pe: MBLK	RL 20 20 20 C RL 20	Qual Units mg/L Qual Units mg/L Qual	< 20 < 20 < 20 < 20 Result 1100	Spike 1000 Spike 1000 1000	SPK Ref Val 0 SPK Ref Val 0 0	%REC 109.6 %REC 109.6 109.8	Low Limit 90 Low Limit 90	High Limit 110 High Limit 110 110	Analyzed 12/13/2012 12/13/2012 12/13/2012 Date Analyzed 12/13/2012 Date Analyzed 12/13/2012



http://www.teklabinc.com/

Client: Barr Engineering Company

Work Order: 12120697

Client Project: National Tailings Pile - Design and Construction

Batch R171635 SampType:	MSD		Units mg/L					RPD	Limit 15	
SampID: 12120697-001BMSD										Date Analyzed
Analyses		RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref	Val %RPD	
Total Dissolved Solids		20		1150	500	620.0	106.0	1140	0.87	12/13/2012
STANDARD METHODS 2540 D)	15158								
Batch R171644 SampType: SampID: MBLK	MBLK		Units mg/L							Date
Analyses		RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Analyzed
Total Suspended Solids		6		< 6						12/14/2012
Batch R171644 SampType: SampID: LCS	LCS		Units mg/L	e e						Date
Analyses		RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Analyzed
Total Suspended Solids		6		93	100	0	93.0	85	115	12/14/2012
Total Suspended Solids		6		104	100	0	104.0	85	115	12/14/2012
Total Suspended Solids		6		100	100	0	100.0	85	115	12/14/2012
3atch R171644 SampType:	DUP		Units mg/L					RPD Limit 15		
SampID: 12120697-001B DUP		DI	01	D14	C!1	SPK Ref Val	%REC	RPD Ref \	/al %RPD	Date Analyzed
Analyses Tatal Supported Salida		RL 6	Qual	< 6	Spike	Of ICITOR Val	701120	0	0.00	12/14/2012
Total Suspended Solids		0		~ 0				O	0.00	12/14/2012
STANDARD METHODS 5310 C	1817/2010/19	ANIC CA						Property of the		
SampID: MB-R171662 SampType:	MBLK		Units mg/L							Date
Analyses		RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Analyzed
Total Organic Carbon (TOC)		1.0		< 1.0						12/14/2012
3atch R171662 SampType:	LCS	8	Units mg/L						0,11 11 2 2	la de
SampID: LCS-R171662										Date
Analyses		RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Analyzed
Total Organic Carbon (TOC)		10.0		63.2	59.7	0	105.8	90	110	12/14/2012
	MS		Units mg/L			20 0 12 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0				Date
Batch R171662 SampType: BampID: 12120697-001EMS	mo									
	mo	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Analyzed
SampID: 12120697-001EMS		RL 1.0	Qual	Result 5.6	Spike 5.0	SPK Ref Val 0.9500	%REC 92.6	Low Limit 85	High Limit	Analyzed 12/14/2012
SampID: 12120697-001EMS Analyses			Qual Units mg/L					85	3	and the second of the second
SampID: 12120697-001EMS Analyses Total Organic Carbon (TOC) Batch R171662 SampType:				5.6		0.9500	92.6	85 RPD	115	12/14/2012



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Client: Barr Engineering Company

Work Order: 12120697

Client Project: National Tailings Pile - Design and Construction

Batch 84205	SampType:	MBLK		Units µg/L							
SampID: MB-84205											Date
Analyses			RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Analyzed
Cadmium			2.00		< 2.00	2.00	0	0	-100	100	12/14/2012
Zinc			10.0		< 10.0	10.0	0	0	-100	100	12/14/2012
Batch 84205 SampID: LCS-84205	SampType:	LCS		Units µg/L			3. 42. = 1.3				Date
Analyses			RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Analyzed
Cadmium			2.00		45.7	50.0	0	91.4	85	115	12/14/2012
Zinc			10.0		478	500	0	95.7	85	115	12/14/2012
Batch 84205 SampID: 12120697-0	SampType: 001DMS	MS		Units µg/L			3 1 2				Date
Analyses			RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Analyzed
Cadmium			2.00		42.0	50.0	0	84.0	75	125	12/14/2012
Zinc			10.0		566	500	125.1	88.1	75	125	12/14/2012
Batch 84205 SampID: 12120697-0	SampType:	MSD		Units µg/L					RPD	RPD Limit 20	
Analyses	8 S		RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref	Val %RPD	Date Analyzed
Cadmium			2.00		41.9	50.0	0	83.8	42	0.24	12/14/2012
Zinc			10.0		567	500	125.1	88.3	565.7	0.18	12/14/2012
EPA 600 4.1.4, 200	.7R4.4, MET	ALS B	Y ICP (T	OTAL)							
Batch 84207 SampID: MB-84207	SampType:	MBLK		Units µg/L							Date
Analyses			RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Analyzed
Cadmium			2.00		< 2.00	2.00	0	0	-100	100	12/14/2012
Zinc			10.0		< 10.0	10.0	0	0	-100	100	12/14/2012
Batch 84207 SampID: LCS-84207	SampType:	LCS		Units µg/L				990			Date
Analyses			RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Analyzed
Cadmium			2.00		48.9	50.0	0	97.8	85	115	12/14/2012
Zinc			10.0		515	500	0	103.0	85	115	12/14/2012
Batch 84207 SampID: 12120697-0	SampType: 001CMS	MS		Units µg/L				N N		-	Date
Analyses			RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Analyzed
Cadmium			2.00		46.3	50.0	0	92.6	75	125	12/14/2012
			10.0		621	500	136.8	96.9	75	125	12/14/2012



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Client Project: National Tailings Pile - Design and Construction

EPA 600 4.1.4, 200	.7R4.4, ME1	TALS B	Y ICP (T	OTAL)		H=[1]		ografia Geografia Gilleria de la completa	100		
Batch 84207 SampID: 12120697-	SampType:			Units µg/L					RPI	D Limit 20	D-4-
	OUTOWOD		RL	Qual	Pagult	Spike	SPK Ref Val	%RFC	RPD Ref	Val %RPD	Date Analyzed
Analyses Cadmium			2.00	Quai	46.2	50.0	0	92.4	46.3	0.22	12/14/2012
Zinc			10.0		619	500	136.8	96.5	621.3	0.34	12/14/2012
STANDARD METH	ODS 3030 I	E, 3113	B, MET	ALS BY GFAA							
Batch 84203 SampID: MB-84203	SampType:	MBLK		Units µg/L							Date
Analyses			RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Analyzed
Lead			2.00		< 2.00	2.00	0	0	-100	100	12/14/2012
Batch 84203 SampID: LCS-84203	SampType:	LCS		Units µg/L			9				Date
Analyses			RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Analyzed
Lead			2.00	-	14.4	15.0	0	96.2	85	115	12/14/2012
Batch 84203 SampID: 12120697-	SampType: 001CMS	MS		Units µg/L							Date
Analyses			RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Analyzed
Lead			2.00			15.0	4.6325	93.3	70	130	12/14/2012
3atch 84203 SampID: 12120697-	SampType:	MSD		Units µg/L					RPE	Limit 20	Date
Analyses			RL	Qual	Result	Snika	SPK Ref Val	%REC	RPD Ref	Val %RPD	Analyzed
Lead			2.00	Quai		15.0	4.6325	95.1	18.6274	1.43	12/14/2012
STANDARD METH	ODS 3030 B	3, 3113	B. META	ALS BY GFAA	DISSOL	VED)					
3atch 84204 SampID: MB-84204	SampType:	CONTRACTOR OF THE SECOND		Units µg/L		200° 200° 200° 200° 200° 200° 200° 200°					Date
Analyses			RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Analyzed
Lead			2.00		< 2.00	2.00	0	0	-100	100	12/14/2012
Batch 84204 SampID: LCS-84204	SampType:	LCS	25.	Units µg/L		17 7 1 a					Date
Analyses			RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Analyzed
Lead			2.00	A. max	14.3		0	95.5	85	115	12/17/2012
Batch 84204 SampID: 12120697-0	SampType: 001DMS	MS	***************************************	Units µg/L						W _H	Date
Analyses			RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Analyzed
Lead			2.00		18.2		4.6357	90.5	70	130	12/14/2012



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Client: Barr Engineering Company

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STANDARD METH	HODS 3030 E	, 3113	B, META	ALS BY GFAA	(DISSOL	VED)		12614			
Batch 84204	SampType:	MSD		Units µg/L					RPD Lir	nit 20	
3ampID: 12120697	-001DMSD										Date
Analyses			RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Analyzed
Lead			2.00		17.8	15.0	4.6357	87.9	18.2171	2.22	12/14/2012



Receiving Check List

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Client: Barr Engineering Company Client Project: National Tailings Pile - Design and Cor	nstruction	work Order: 121206 Report Date: 19-Dec						
Carrier: Neil Talbot Completed by: Follows On: Follows 13-Dec-12 Emily E. Pohlman	Rev O	ved By: SRH lewed by: n: ec-12	MUH Michael L. Austin					
Pages to follow: Chain of custody 1 Shipping container/cooler in good condition? Type of thermal preservation? Chain of custody present? Chain of custody signed when relinquished and received? Chain of custody agrees with sample labels? Samples in proper container/bottle? Sample containers intact? Sufficient sample volume for indicated test? All samples received within holding time? Reported field parameters measured: Container/Temp Blank temperature in compliance? When thermal preservation is required, samples are compliant.		No	Not Present Blue Ice NA		Temp °C 3.2 Dry Ice			
[0.1°C - 6.0°C, or when samples are received on ice the same Water – at least one vial per sample has zero headspace? Water - TOX containers have zero headspace? Water - pH acceptable upon receipt? NPDES/CWA TCN interferences checked/treated in the field?	Yes	No	No VOA vials No TOX containers NA	> >				
Any No responses n	nust be detailed belov	v or on the C	OC.					

														<u></u>														12120697				
Chain of Custody 1001 Diamond Ridge, Suite 1100 BADD Jefferson City, MO 65109												Parameters Water Soil														COC 1 of 1						
	(573) 63												П														٦		Project Manager:	Ty N	Iorris	
	Project Number: 25860003	.06 TLM2	030																			ļ					ł	r.S				
		Project Name: National Tailings Pile - Design and Construction																									Ì	Number of Containers	Project QC Contact	: <u>Aı</u>	idrea N	ord
1		Sample Origination State: MO (use two letter postal state abbreviation)														rbon			Solids							Ì	of Cor	Sampled				
	COC Number: DRC NAT	OC Number: DRC NAT NAT 121212												On fotal Suspended Solids	Solids	Total Organic Carbon		letals	solved								uber o	By:	Stephen M		Aoilane	
			1	Depth	l 		├	Matrix	-		Туре			Susp	sable (Orga	Metals	lved M	Disso		11		İ					l Nun	Laboratory:	_Te	klab	_
7	Location	Start Depth	Stop Depth	Unit (m./ft. or in.)	Collection Date (mm/dd/yyyy)	Collection Time (bh:mm)	Water	Soil	-	Grab	Comp	ος	Hd	Sulfa	Settleable	Total	• Total	Dissolved Metals	• Hardness • Total Dis									Total	1			
}	1. Nat-East				19/19/15	10:50	х			х			x						x x	Γ								5	Preservative Unpreserve		NO3, 1	H2SO4
	2.			ł					-																							
	3.																											-				
	4																				ļ.,.	7	,	7	11 .							
	5.	-													T				\top	-,-		-	. 4 (117				 ī				
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	6.			-											+	T			_	+	 			+	\dagger	\Box						
	7.		 -	 					_						-	\vdash		_	-	\vdash	╁		+	+	+-	+	-		ļ			
	8. Comments: Invoice to Ma at Doe Run. Matrix is surface water. Metals include Cadmium, I		at Doe F	Run. Resu	ilts to be sent to	Allison Olds	1 ; (aol 13	ds@ba	117.00 J.	om):	at Bar	r Eng	ginee	ring,	And	Irea	Nor	rd (ar	norda OLS	il @ba LN	TT.CO	m) 17/4	at B	arr I	Engi	neeri	ing,	and N	Mark Nations	(mnati	ons@do	perun.co
														√13 ∕ te:			u. i	_	$\neg \vdash$						1_	 ترکیست				7. 1	Time:	
Stephen Mollanen Stephen Mollanen Palinguished Presented in the Palinguish Presented in								Date. Time.						+	Received by: 27 Life Life									Date: 1/14	1,2	Time:	0.75					
#2 - Semivolatile Organics = PAHs, PCP, Dioxins, 8270									Date: 12 Tiple: 05 Received by: Date: Haim								∿ _	Patel 13	12	Time:	:05											
#3 - General = pH, Chloride, Fluoride, Alkalinity, TSS,								al Expr	ress (Jsár Lev	Sampler Air Bill Number:																					

Distribution: White - Original Accompanies Shipment to Lab; Yellow - Field Copy; Pink - Lab Coordinator

@ DRL

#4 - Nutrients = COD, TOC, Phenols, Ammonia Nitrogen,

TDS, TS, Sulfate

TKN